

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1-2. Canceled

3. (Currently Amended) A thermal storage method wherein, where thermal storage temperature is T, variation in enthalpy in a chemical reaction is ΔH , variation in entropy is ΔS , and variation in free energy is ΔG , a thermal storage material satisfying a relationship of

$$T\Delta S \geq \Delta G$$

is used under a condition of

$$\Delta H > 0$$

so as to promote a reaction that changes said thermal storage material into a thermal storage material in an energy storing state by adding supplemental energy when changing said thermal storage material into said thermal storage material in the energy storing state by decomposing or separating said thermal storage material; and

~~The thermal storage method according to claim 1, wherein said supplemental energy is light, and to promote the reaction for changing that changes said thermal storage material into said thermal storage material in the energy storing state by adding the supplemental energy is to promote the reaction for changing said thermal storage material into said thermal storage material in the energy storing state by a photocatalytic reaction.~~

4. (Currently Amended) The thermal storage method according to claim ~~2~~ 3, wherein said thermal storage material and said thermal storage material in the energy storing state include a substance condensable or a substance storable by absorption and convertible to an ion-conducting substance.

5. (Original) The thermal storage method according to claim 4, wherein said ion-conducting substance is proton.

6. (Currently Amended) The thermal storage method according to claim ~~2~~ 3, wherein said thermal storage material includes a substance for absorbing heat by a dehydrogenating reaction of O-H coupling and C-H coupling.

7. Canceled

8. (Currently Amended) The thermal storage apparatus according to claim ~~7~~ 10, claim 11, or claim 20, further comprising:

a heating fluid passage, having a part of it placed in said thermal storage reaction portion, ~~of for~~ heating said thermal storage reaction portion with a heating fluid circulating inside it;

a thermal storage material storage portion ~~of for~~ storing said thermal storage material,

wherein said heat source is said heating fluid passage; and

said heating fluid passage contacts with said thermal storage material storage portion more upstream side than said thermal storage reaction portion so as to heat said thermal storage material storage portion.

9. (Currently Amended) The thermal storage apparatus according to claim ~~7~~ 10, claim 11, or claim 20, further comprising a heat exchanger between said energy storing thermal storage material storage portion and said thermal storage reaction portion or in said energy storing thermal storage material storage portion,

wherein said heat source is said heat exchanger; and

said heat exchanger recovers the heat of said thermal storage material in the energy storing state and heats said thermal storage material with said recovered heat.

10. (Currently Amended) A thermal storage apparatus comprising:

a heat source;

a supplemental energy supply portion for adding said supplemental energy;

a thermal storage reaction portion for changing said thermal storage material into said thermal storage material in the energy storing state by decomposing or separating said thermal storage material with heat from said heat source and said supplemental energy from said supplemental energy supply portion;

an energy storing thermal storage material storage portion for storing said thermal storage material in the energy storing state;

exothermic reaction portion for coupling said thermal storage material in the energy storing state;

a heated fluid passage for receiving heat from said exothermic reaction portion; and

~~The thermal storage apparatus according to claim 7, comprising a supplemental energy control portion of for adjusting an amount of said supplemental energy correspondingly to change in temperature of said thermal storage reaction portion.~~

11. (Currently Amended) A thermal storage apparatus comprising:

a heat source;

a supplemental energy supply portion for adding said supplemental energy;

a thermal storage reaction portion for changing said thermal storage material into said thermal storage material in the energy storing state by decomposing or separating said thermal storage material with heat from said heat source and said supplemental energy from said supplemental energy supply portion;

an energy storing thermal storage material storage portion for storing said thermal storage material in the energy storing state;

exothermic reaction portion for coupling said thermal storage material in the energy storing state;

a heated fluid passage for receiving heat from said exothermic reaction portion; and

~~The thermal storage apparatus according to claim 7,~~ wherein said supplemental energy is electricity;

said thermal storage reaction portion has electrodes and an electrolyte;

said supplemental energy supply portion adds a potential difference between said electrodes; and

said thermal storage reaction portion promotes said decomposition or separation reaction with said added potential difference.

12. (Original) The thermal storage apparatus according to claim 11, wherein said exothermic reaction portion has an electrode portion with a first electrode and a second electrode placed on both sides of the electrolyte and electric terminals connected to said first electrode and said second electrode, supplies at least one kind of said thermal storage material in the energy storing state to said first electrode and supplies other thermal storage material in the energy storing state to said second electrode, so that said thermal storage material in the energy storing state supplied to said first electrode is ionized and moves to said second electrode by way of said electrolyte to cause said electric terminals to generate electricity, and heated fluid of said heated fluid passage is heated by the heat generated on generating the thermal storage material on said second electrode.

13. (Currently Amended) The thermal storage apparatus according to claim 12, wherein said exothermic reaction portion doubles as said thermal storage reaction portion,

and said apparatus comprises a switching means ~~of for~~ switching said electric terminals so that said electric terminals are connected (1) to said supplemental energy supply portion when separating or decomposing said thermal storage material in said

exothermic reaction portion and (2) to the electric terminals for taking out electricity when coupling said thermal storage material in the energy storing state in said exothermic reaction portion respectively.

14. (Currently Amended) The thermal storage apparatus according to claim 12, further comprising an electricity storage means, connected to said electric terminals, ~~of~~ for storing electricity generated on said electric terminals, and

said electricity storage means supplies the electricity to said thermal storage reaction portion via said supplemental energy supply portion so as to promote decomposition or separation of said thermal storage material.

15. (Currently Amended) The thermal storage apparatus according to claim 14, further comprising a thermal storage reaction portion heating means ~~of~~ for heating said thermal storage reaction portion by having the electricity supplied from said electricity storage means on decomposing or separating said thermal storage material.

16. (Currently Amended) The thermal storage apparatus according to claim 12, further comprising an electric heat conversion means connected to said electric terminals and placed to thermally contact said heated fluid passage, and

wherein said electric heat conversion means converts the electricity generated on generating coupling of said thermal storage material in the energy storing state into heat so as to heat said heated fluid passage.

17. (Currently Amended) The thermal storage apparatus according to claim 12, further comprising an electric heat conversion means connected to said electric terminals and placed to thermally contact said energy storing thermal storage material storage portion, and

wherein said electric heat conversion means converts the electricity generated on generating coupling of said thermal storage material in the energy storing state into heat so as to heat said energy storing thermal storage material storage portion.

18. (Original) A heat source system, further comprising the thermal storage apparatus according to claim 16 or 17,

wherein said electric heat conversion means is a heat pump; and

said heat pump generates heat and cold from the electricity generated on generating coupling of said thermal storage material in the energy storing state, heats said heated fluid passage and/or said energy storing thermal storage material storage portion with said heat, and cools said energy storing thermal storage material storage portion with the cold.

19. Canceled

20. (Currently Amended) A thermal storage apparatus comprising:

a heat source;

a supplemental energy supply portion for adding said supplemental energy;

a thermal storage reaction portion for changing said thermal storage material into said thermal storage material in the energy storing state by decomposing or separating said thermal storage material with heat from said heat source and said supplemental energy from said supplemental energy supply portion;

an energy storing thermal storage material storage portion for storing said thermal storage material in the energy storing state;

exothermic reaction portion for coupling said thermal storage material in the energy storing state;

a heated fluid passage for receiving heat from said exothermic reaction portion; and

~~The thermal storage apparatus according to claim 7,~~ wherein the supplemental energy is light;

said thermal storage reaction portion has a light exposure surface; and

said supplemental energy supply portion supplies the light to said light exposure surface so as to promote the decomposition or separation.